

REMARKS/ARGUMENTS

Claim 1 has been amended to require the polyureas to be non-crosslinked; the average amine functionality of the amines excluding unreactive tertiary amino groups to be from 2.1 to 5; and the steps of the process to include (i) reacting the one or more carbonates with the one or more amines to yield condensation products (A) comprising one carbamate group and from 1 to 4 amino groups reactive with a carbamate group, or one amine group reactive with a carbamate group and from 1 to 4 carbamate groups, and (ii) reacting intermolecularly the condensation products (A) to form a polycondensation products (P) comprising both carbamate and amino groups, the polycondensation products (P) containing branching but no crosslinking. Support for these amendments exists throughout the present specification, including page 6, lines 6-14; page 8, lines 5-9; page 9, line 15 to page 10, line 8.

Claims 1-9 are currently pending.

The Office Action rejected claim 9 under 35 U.S.C. § 102 as anticipated by U.S. patent 7,176,271 or PCT patent application publication no. WO 03/066702 (“Bruchmann”), U.S. patent application publication no. 2002/0161113 (“Dvornic”), Dendritic and “Hyperbranched polymers...” (“Kumar I”), and “Novel hyperbranched polymer....” (“Kumar II”).

Similarly, the Office Action rejected claim 9 under the judicially created doctrine of obviousness type double patenting over claims in Bruchmann and U.S. patent application serial no. 10/586,650 (“the ‘650 application”).

In view of the following comments, Applicants respectfully request reconsideration and withdrawal of these rejections.

Claim 9 is a product by process claim. That is, claim 9 covers the highly branched polyurea produced according to claim 1. The process according to claim 1 produces a

polyurea which differs from the polyureas in the applied references. Accordingly, claim 9 relates to a different polyurea than the applied references.

More specifically, the claimed process requires (i) reacting one or more carbonates with the one or more amines to yield condensation products (A) comprising one carbamate group and from 1 to 4 amino groups reactive with a carbamate group, or one amine group reactive with a carbamate group and from 1 to 4 carbamate groups, and (ii) reacting intermolecularly the condensation products (A) to form a polycondensation products (P) comprising both carbamate and amino groups, the polycondensation products (P) containing branching but no crosslinking. This process differs significantly from the processes disclosed in the applied art, which means that the products from such processes also differ significantly.

Bruchmann employs a bifunctional capped diisocyanate or polyisocyanate to produce a hyperbranched polyurea. The process is more fully described at cols. 5-8 of the reference. The employed capped diisocyanate contains a bivalent radical, R2. (See, col. 6, lines 22-28). The radical R2 is present in the final polyurea product.

In stark contrast, the processes of the present invention do not yield polyureas having such R2 groups. The invention processes utilize carbonate compounds which yield polyureas which do not contain any R2 residues. (See, for example, products (6) and (7) on page 10 of the present application which contain carbamate groups in contrast to Bruchmann's polyureas). Furthermore, polyamines in the polyureas of the present invention are directly linked together via urea linkages (see, for example, products (6) and (7) on page 10 of the present application). Thus, the polyureas of the present invention and the polyureas produced in Bruchmann differ significantly structurally

Stated another way, the products of the present invention cannot be obtained by the processes disclosed and claimed in Bruchmann, nor can the products in Bruchmann be obtained by the processes disclosed and claimed in the present application.

The '650 application discloses and claims processes including the use of ureas. These processes do not result in the presence of carbamates in the polyurea product. (See, for example, products (6) and (7) on page 11 of the '650 application which contain urea groups instead of carbamate groups (per products (6) and (7) on page 10 of the present application). Thus, the products of the present invention differ significantly structurally from the products in the '650 application. In other words, the products of the present invention cannot be obtained by the processes disclosed and claimed in the '650 application, nor can the products in the '650 application be obtained by the processes disclosed and claimed in the present application.

Dvornic employs a diisocyanate or polyisocyanate to produce a hyperbranched polyurea. Similar to Bruchmann, this process results in a polyurea having residues introduced by the isocyanate compounds. Furthermore, the polyureas obtained by Dvornic's process do not contain any carbamates -- they are either isocyanate- or amine-terminated. (See, par. [0025]). Clearly, Dvornic does not teach or suggest the claimed processes, which means that Dvornic's polyureas are significantly different from the polyureas in claim 9.

Kumar I and Kumar II disclose processes yielding polyureas which do not contain any carbamates -- they are amine-terminated only. (See, page 619 of Kumar I and page 1629 of Kumar II). Neither Kumar references teaches or suggests the claimed processes, which means that the polyureas in these references are significantly different from the polyureas in claim 9.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejections of claim 9 under 35 U.S.C. § 102 and under the judicially created doctrine of double patenting.

The Office Action also rejected claims 1-4 and 9 under 35 U.S.C. § 102 as anticipated by U.S. patent 2,682,525 (“Jackson”). In view of the following comments, Applicants respectfully request reconsideration and withdrawal of this rejection.

Jackson expressly teaches crosslinking his compounds to produce compounds which yield highly insoluble films. In stark contrast, the present invention relates to processes for producing non-crosslinked polyureas, and to the non-crosslinked polyureas *per se*. Thus, not only does Jackson fail to teach the non-crosslinked present invention, but Jackson actually teaches away from it.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102 based upon Jackson.

The Office Action also rejected claims 1-9 under 35 U.S.C. § 112, first and second paragraphs, as being indefinite and failing to satisfy the written description requirement because they contain the phrase “highly branched”. In view of the following comments, Applicants respectfully request reconsideration and withdrawal of this rejection.

“Highly branched” and “hyperbranched” are synonymous terms which are well known in the art. (See, for example, the Kumar references). Generally speaking, highly branched polymers are obtained by self-condensation polymerization using an AB_x type monomer in which A and B are functional groups which react with each other but not with themselves. The term “highly branched” refers to the fact that each of the AB_x type monomer units introduces a further branching site into the polymer.

In this regard, Applicants note that a search of the USPTO website for patents containing the word “polymer” in the specification and the term “hyperbranched” in the claims yields 206 hits, and that a search of the USPTO website for patents containing the word “polymer” in the specification and the phrase “highly branched” in the claims yields

161 hits. Clearly, the questioned phrase occurs often in issued claims, so it must be definite and readily understood by one of ordinary skill in the art.

In view of the above, Applicants respectfully submit that the phrase “highly branched” has a known meaning within the art, is definite, and satisfies the written description requirement of 35 U.S.C. § 112. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 112.

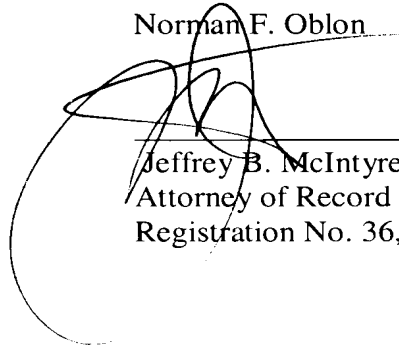
Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

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